What is claimed is:

1. An osteogenic sponge composition useful for the induction of new bone growth in a mammal, comprising:

a resorbable sponge matrix material;

an osteogenic factor, said osteogenic factor incorporated in said sponge matrix material in an amount that causes an increased rate of resorption of said sponge matrix material in a mammal; and

particulate mineral having an average particle diameter of at least about 0.5 mm embedded in said resorbable sponge matrix material, said particulate mineral present in a weight ratio of at least 4:1 relative to said resorbable sponge matrix material, so as to provide a scaffold for bone ingrowth in the presence of said osteogenic factor.

2. The osteogenic sponge composition of claim 1, wherein said particulate mineral is present in a weight ratio of at least about 10:1 relative to said resorbable sponge matrix material.

3. The osteogenic sponge composition of claim 1, wherein said osteogenic factor comprises a bone morphogenetic protein, a LIM mineralization protein, or a nucleotide sequence encoding a bone morphogenetic protein or a LIM mineralization protein.

4. The osteogenic sponge composition of claim 1, wherein said resorbable sponge matrix material includes collagen.

5. The osteogenic sponge composition of claim 3, wherein said resorbable sponge matrix material includes collagen.

6. The osteogenic sponge composition of claim 1, wherein said particulate mineral is selected from the group consisting of bone particles and biocompatible synthetic calcium phosphate ceramics.

7. The osteogenic sponge composition of claim 6, wherein said particulate mineral comprises biphasic calcium phosphate.

8. The osteogenic sponge composition of claim 7, wherein said biphasic calcium phosphate has a porosity of at least about 50%.

9. The osteogenic sponge composition of claim 8, wherein said particulate mineral includes bone particles.

10. The osteogenic sponge composition of claim 9, wherein said bone particles are cortical bone particles.

11. The osteogenic sponge composition of claim 1, which is comprised at least about 95% by weight of said particulate mineral.

12. The osteogenic sponge composition of claim 1, wherein said particulate mineral has an average particle size in the range of about 0.5 mm to about 5.0 mm.

13. The osteogenic sponge composition of claim 1, wherein said porous particulate mineral has an average particle size in the range of about 1 to about 2 mm.

14. The osteogenic sponge composition of claim 1, wherein said osteogenic factor is a bone morphogenetic protein.

15. The osteogenic sponge composition of claim 14, wherein said bone morphogenetic protein is a recombinant human protein.

16. The osteogenic sponge composition of claim 15, wherein said bone morphogenetic protein is BMP-2 or BMP-7.

17. The osteogenic sponge composition of claim 16, further comprising an osteogenic enhancing factor selected from the group consisting of autographic bone marrow, allographic bone marrow, transforming growth factor-β, fibroblast growth factor, platelet-derived growth factor, insulin-like growth factor, microglobulin-β, and steroids.

18. An osteogenic sponge composition effective for the induction of new bone growth in a primate, comprising:

a resorbable sponge matrix material;

an osteogenic factor that stimulates osteoblasts and osteoclasts, said osteogenic factor incorporated in said sponge matrix material in an amount that causes an increased rate of resorption of said sponge matrix material in the primate; and

particulate mineral having an average particle diameter of at least about 0.5 mm embedded in said resorbable sponge matrix material, said particulate mineral present in a weight ratio of at least 4:1 relative to said resorbable sponge matrix material, so as to provide a mineral scaffold for a duration sufficient for osteoid ingrowth through an area in which said sponge composition is implanted.

19. The sponge composition of claim 18 wherein the primate is a human.

20. A method for inducing bone growth in a primate, comprising:

(a) providing an osteogenic sponge composition comprising:

a resorbable sponge matrix material;

an osteogenic factor that stimulates osteoblasts and osteoclasts, said osteogenic factor incorporated in said sponge matrix material in an amount that causes an increased rate of resorption of said sponge matrix material in the primate; and

particulate mineral having an average particle diameter of at least about 0.5 mm embedded in said resorbable sponge matrix material, said particulate mineral present in a weight ratio of at least 4:1 relative to said resorbable sponge matrix material, so as to provide a scaffold for bone ingrowth in the presence of said ostegenic factor; and

(b) implanting said osteogenic sponge composition in an area in which bone growth is desired in the primate, said osteogenic sponge composition providing a scaffold for a duration sufficient for osteoid ingrowth through an area in which said osteogenic sponge composition is implanted.

21. The method of claim 20, wherein said particulate mineral is present in a weight ratio of at least 10:1 relative to said resorbable sponge matrix material.

22. The method of claim 21, wherein said osteogenic factor comprises a bone morphogenetic protein, a LIM mineralization protein, or a nucleotide sequence encoding a bone morphogenetic protein or LIM mineralization protein.

23. The method of claim 20, wherein said resorbable sponge matrix material includes collagen.

24. The method of claim 22, wherein said resorbable sponge matrix material includes collagen.

25. The method of claim 20, wherein said particulate mineral is selected from the group consisting bone, a synthetic biocompatible calcium phosphate ceramic, or a mixture thereof.

26. The method of claim 25, wherein said porous particulate mineral comprises biphasic calcium phosphate.

27. The method of claim 26, wherein said biphasic calcium phosphate has a porosity of at least about 50%.

28. The method of claim 20, wherein said particulate mineral includes bone particles.

29. The method of claim 28, wherein said bone particles are cortical bone particles.

30. The method of claim 20, wherein said osteoinductive sponge composition is comprised at least about 95% by weight of said particulate mineral.

31. The method of claim 20, wherein said particulate mineral has an average particle size of about 0.5 mm to about 5.0 mm.

32. The method of claim 20, wherein said porous particulate mineral has an average particle size of about 1 to about 2 mm.

33. The method of claim 20, wherein said osteogenic factor is a bone morphogenetic protein.

34. The method of claim 33, wherein said bone morphogenetic protein is a recombinant human protein.

35. The method of claim 33, wherein said bone morphogenetic protein is BMP-2 or BMP-7.

36. The method of claim 20, wherein the primate is a human.

37. The method of claim 20, wherein the area is in the spine of said primate.

38. The method of claim 37, wherein the bone growth is induced to attain a spinal fusion.

39. The method of claim 38, wherein the spinal fusion is an interbody spinal fusion.

40. The method of claim 38, wherein the spinal fusion is a posterolateral spinal fusion.

41. The method of claim 38, wherein the spinal fusion includes a fusion between transverse processes of adjacent vertebrae.

42. An osteogenic sponge composition for the induction of new bone growth in a primate, comprising:

a carrier consisting essentially of a resorbable sponge matrix with particulate mineral embedded in said resorbable sponge matrix, said particulate mineral present in an amount constituting at least about 95% by weight of said carrier; and

an osteogenic factor.

43. A highly mineralized sponge implant device consisting essentially of a resorbable sponge matrix formed of collagen and having particulate biocompatible mineral embedded within said matrix, said device comprised 1% to 3% by weight of the collagen

and 97% to 99% by weight of the particulate biocompatible mineral.

44. The device of claim 42 wherein the particulate biocompatible mineral comprises bone particles.

45. The device of claim 42 wherein the particulate biocompatible mineral includes a synthetic ceramic.

46. The device of claim 44 wherein the ceramic material includes a calcium phosphate ceramic.

47. The device of claim 45 wherein the calcium phosphate ceramic is biphasic calcium phosphate.

48. An osteogenic implant, comprising:

a resorbable matrix carrier comprised 1% to 3% by weight of collagen in sponge form and 97% to 99% by weight of a particulate biocompatible mineral embedded within said collagen; and

an osteogenic factor.

49. An interbody spinal fusion device, comprising:

a load bearing member sized for insertion between adjacent vertebrae; and

a composition according to any of claims 1-19 and 42-48 retained by said load bearing member.

50. A method for interbody spinal fusion in a mammal, comprising implanting between adjacent vertebrae in the mammal an interbody spinal fusion device according to claim 49.

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